PEOPLE DRIVEN PRODUCTIVITY: LEAN FOR SMALL BUSINESSES

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Abstract

Lean as structured method to improve productivity has earned its undisputed place during the last 10 years. The combination of a people-oriented philosophy, combined with simple but effective methods, has led to considerable improvements in almost all industry sectors. However it becomes increasingly clear that introducing Lean requires knowledge and efforts that are outside the possibilities of small businesses. The paper reports on the preliminary results of a concerted research effort towards an effective method to introduce Lean in small production enterprises (SME's). Anticipated results are operational and practical findings for improving success rates of adoption. This should widen considerably the range of businesses that can benefit from this structured improvement process. It would also allow policymakers to better target support measures to small businesses.

Keywords Lean Manufacturing, SME, change management

Introduction

As low-wage economies are growing rapidly, EU manufacturers are under increasing pressure to be more innovative and flexible. Lean Manufacturing is a proven method of increasing productivity. While large companies seem to have embraced manufacturing philosophies such as Lean and Six Sigma, empirical evidence suggests this is not the case for SMEs as reported by (Shah & Ward, 2003): "despite organisational inertia effects, large firms are more likely to implement lean practices than their smaller counterparts". (Von Axelson, 2009) adds that Lean knowledge is mainly tied up in large manufacturers and has not widely spread among SMEs.

SMEs, i.e. companies with less than 250 employees, are however very important within the EU economic structure. In a recent annual SME report commissioned by the European Commission, (Audretsch et al, 2009) the importance of SMEs is evidenced: 99% of Europe's non-financial companies are SMEs, accounting for 67% of employment. As (Antony et al, 2005) rightfully state, SMEs also act as suppliers to larger organisations and thus achieve a "footprint" that is even larger than these numbers suggest. While SMEs are shown to have a lower labour productivity and lower profitability than their large counterparts (Van Volsem & Van Landeghem, 2009), they are acknowledged as essential for economic growth, innovation and knowledge transfer.

Trying to understand the difficulties SMEs have in implementing Lean, we could start by studying what diversifies them from their large counterparts (Von Axelson, 2007): Resources, Management and Organization. SMEs have clearly less resources, both in time and money. Their management style tends to be short-term oriented (Antony et al, 2005) without much strategic alignment and performance follow-up (Smart et al, 2004). However

the management team is usually small and centralized, multidisciplinary 'hands-on', informal and people oriented (Ghobadian et al, 1996). Each of these last elements seems to be rather beneficial for a Lean programme to be implemented. Good top-management leadership has higher leverage in small companies and is the major critical success factor for Lean in an SME (Achanga et al, 2006).

From the above reasoning one could conclude that SMEs offer a more suitable environment for successful Lean implementation. However, limited resources (skills, labour time and financial resources) cause major implementation difficulties (Antony et al, 2005). In practice this is the limiting factor for an SME's Lean implementation efforts, while (Achanga et al, 2006) finds Finance and Skills/Expertise to be two of the critical success factors. So the challenge is to find a method that exploits the strengths of SMEs, while avoiding their limitations.

Project ERIP: European Regions for Innovative Productivity

The strategic importance of SMEs and their limited ability to attract knowledge to boost labour productivity and competitiveness have incited the EC to support the European Regions for Innovative Productivity (ERIP) project through the "Interreg North Sea Region" programme. The project is a partnership between local government (regional development agencies), knowledge institutions and private companies, from 6 regions within England, Belgium, The Netherlands, Germany, Sweden and Norway.

The project wants to facilitate Lean implementations in SMEs by testing a "Lean Change Methodology" adapted to small companies, and by setting up a knowledge network – the so-called "Innovative Productivity Centres" - that actively provides support, training and knowledge exchange in each partner region. 24 SMEs are actively testing the method. Knowledge networks are an adequate way to introduce Lean principles in SMEs, as backed by Swedish empirical research in (Von Axelson, 2009). The challenge however is that both the network itself as the transferred knowledge and improvements in the individual companies

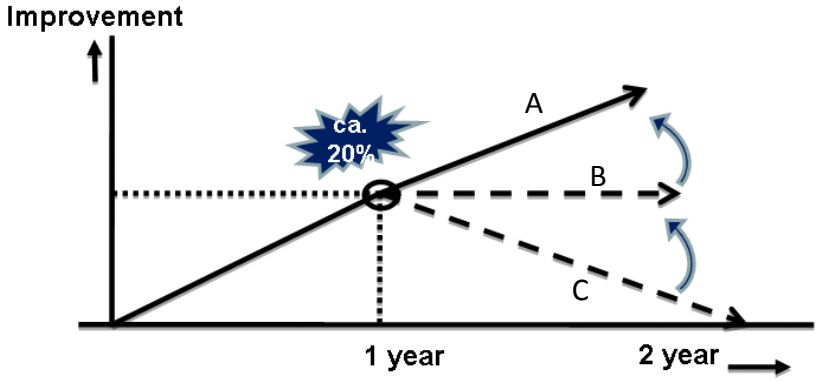

Figure 1. Sustainable improvement scenario's (Bateman 2000)

need to be sustainable. A performance pattern that typically emerges in SMEs implementing Lean techniques is initially encouraging results, but a later fallback (typically within 2 years after implementation start – scenario B and C in Figure 1). Sustainability in improvement for an SME means continuing the improvement effort (Bateman & David, 2002) be it with or without external support (A in Figure 1).

The Framework of the Lean Change Methodology

The "Lean Change Methodology" as tested in the ERIP project has been based on the experience in the different participating regions, most notably the MAS-NEPA method in England (Herron & Braiden, 2006), which has already helped more than 150 companies achieve sustainable productivity improvement. However, none of the experiences was within small companies. The ERIP method therefore can be considered as a stripped down version, maximizing effect from minimal theoretical effort. This is backed by (Mulhaney et al, 2004): companies struggle to appreciate how to implement solutions, not which to implement. The Methodology consists of a stepwise approach in 4 phases: Initiation, Improvement Cycles, KPI introduction and Management consolidation.

Initiation

It is of crucial importance to start off on the right foot: typically SMEs have already been through several attempts at structural improvement and expectations are normally very limited towards the new method. First management is required to sign a formal agreement, stating the requirements and engagements expected from the. By signing such an agreement, top management clearly demonstrates their commitment. Initial visits are very essential to build mutual trust; (Von Axelson, 2009) shows this is essential in an efficient knowledge network. Because SMEs generally have a limited management structure, the change agent(s) that will drive the continuous improvement efforts are identified beforehand. A general diagnostic is undertaken to describe the operations and to document the chosen focus area. An introductory training to Lean is mandatory for the management team, in which they are clearly informed about the work force led continuous improvement cycles that will be started, which they will have to support and foster. Then a showcase event is scheduled in which one specific area is analyzed, problems identified, and improvement actions formulated and planned. This event is run by an external expert, who guides a team from the SME through the different steps of the method in a limited time frame (typically one week). In the ERIP project the event was held in one of the SMEs, while employees from the others were present. The showcase makes the method very tangible, and proves that results can be obtained on short notice and by the team members themselves.

Local Area improvement cycles

The main goal of the method is to instill a sustained improvement drive among the workforce. This is initiated by a brainstorming session among the workers, in which they can identify any problem they face in their daily jobs. Each problem is noted down on a yellow post-it and categorized on a board. Such a session lasts typically for 1,5 hours, yielding on average 3 problems per participant. This session has proven to be a very effective kick-off event, beating any theoretical explanations. Experience has shown that it eliminates issues which would otherwise hinder progress in the improvement cycle. It creates a sense of trust, ownership and involvement in operators which see some of their (sometimes already timely) daily irritations and problems solved. With these problems, the workers can start engaging in improvement actions, following the well-known PDCA (Plan-Do-Check-Act) method proposed by (Deming, 1982). Progress is tracked visually on wall-mounted checklists, listing problems, corrective actions and target dates. As needed for the improvement actions, short information sessions are held introducing specific Lean Tools. As the project progresses, some companies might move on from strictly local initiatives (5S, standard work, visual management) to value stream-wide workshops to improve flow, planning and production control, for example. A fixed minimal set of "before, during, and after" measurements are decided upon for research purposes, but also for sustaining momentum in each company.

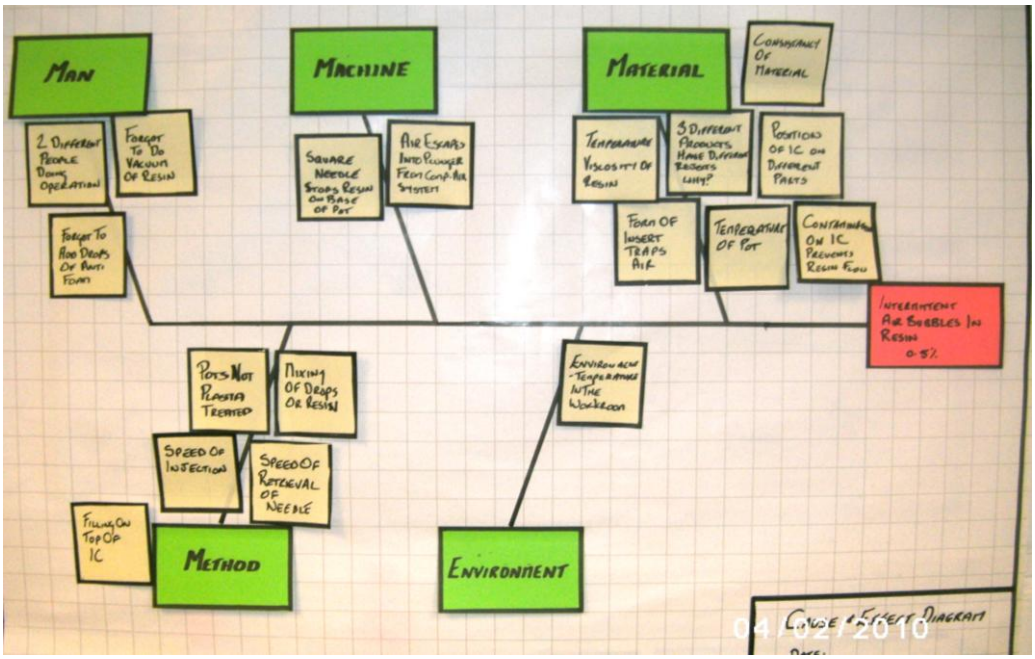

Figure 2. Problem solving Fishbone Diagram of SME 1

Introducing KPI's

Once one or two areas are engaged (typically after a 3 to 6 month period), the first local measurements are gathered. These indicators are then linked to some general Key Performance Indicators. The KPI's are purposely limited to "QCDI": Quality, Cost, Delivery and Inventory. Every month the results are reviewed, and regularly comparisons are made with peer companies participating in the project across regions. This peer comparison serves as a reinforcement to keep the momentum. If an SME is doing extremely well, it will motivate them. If an SME is lagging, then seeing that other SMEs achieve better results will reinvigorate them by showing that improvement goals are attainable.

Management consolidation

Obtaining sustainability is clearly the most difficult part of the method, as argued in the introduction. It is pursued along two actions lines: the local exemplar and the management review. The exemplar is a (large) company that has reached excellence in Lean. Each region has enlisted the support of one or more of these companies, that receive regular visits from the SME's operator teams and also explain some of their training methods. Not only does this show good practice, it gives the SMEs one more opportunity to meet, discuss and exchange experience with both peers and the exemplar company. It has been very clear in our recent empirical experience that the "peer group" effect within the national and transnational SME clusters is very important; at informal discussion opportunities after common trainings, very vivid discussions and experience exchange take place.

The management review installs a regular cycle of short, action-oriented meetings around the visual tools, linking the work force to their line supervision, and the line supervision to management. Due to their size most SMEs have a flat organization, simplifying the introduction of these review cycles. The review exposes SME management to the improvement cycles and their beneficial effect, which will engender support among management for those actions that need investments or encouragement.

Results

The ERIP project has been running for a year now, and the first results are encouraging. Five of the 7 ERIP SMEs have succesfully executed improvement cycles in at least 2 areas of activity, engaging their workforced in a manner that they never have experienced before. Some of them have already solid bottom line results: productivity improvements up to 32 % (figure 4), quality improvements of 50% saving considerable costs in testing (figure 3), a.s.o. The SMEs that lag behind will be remedied by hosting a showcase event in their location. It seems to be an important trigger for both employee involvement and management commitment. Most SMEs are now entering phase III.

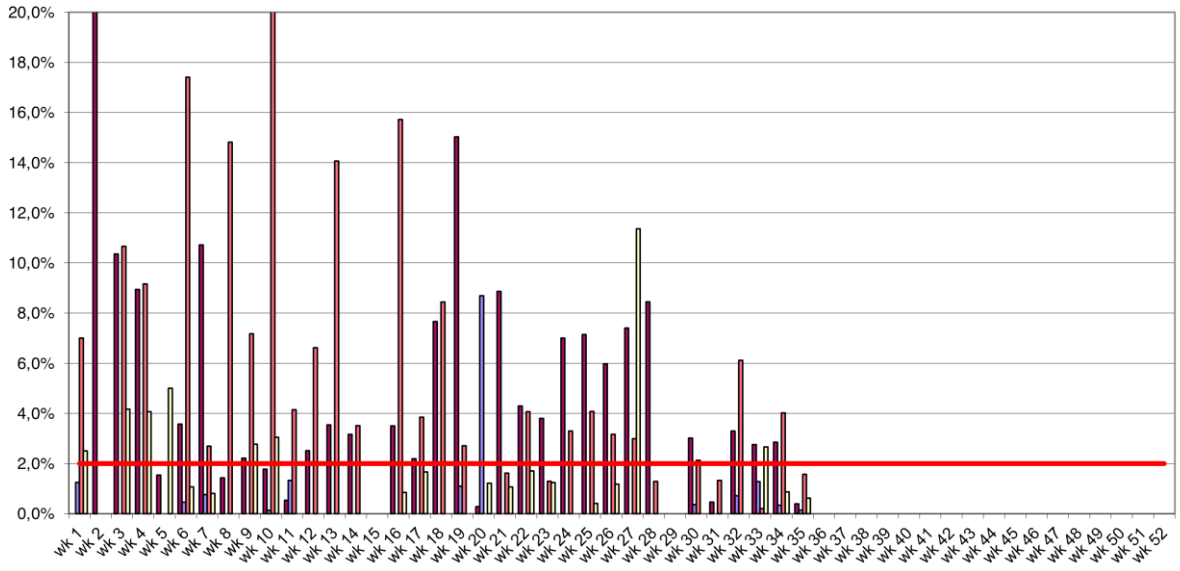

Figure 3. Quality Improvement at SME 1 (% scrap)

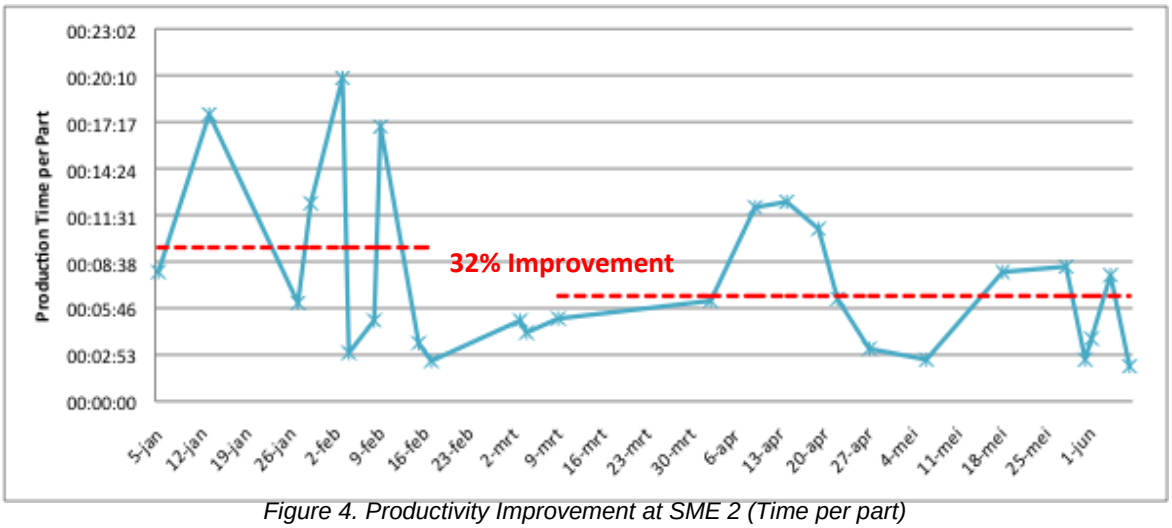

Figure 4. Productivity Improvement at SME 2 (Time per part)

The manner in which the workforce has responded to the appeal for improvement initiative has been overwhelmingly positive. It proves that “people are not against change, they are against being changed”. It has also shown that the carefully chosen steps of the method do work, and that productivity improvements can be initiated with limited time and

resources and almost no cost. The results of this research will be published in an easy to read book, that will serve as manual for SME's.

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